

### ABSTRACT OF THE INVENTION

An interferometric microscope for making interferometric measurements of locations within an object that is in a medium, there being a mismatch between indices of refraction of said object and said medium, the microscope including a source for  
5 generating an input beam; an interferometer which is configured to receive the input beam and generate therefrom a measurement beam, to focus the measurement beam onto a selected spot in the object and produce for that selected spot a return measurement beam, and to combine the return measurement beam and a reference beam to produce an interference beam; and a detector system which is positioned to receive the interference  
10 beam, wherein the return measurement beam travels along a path from the object to the detector system and wherein the interferometer includes a compensating layer of material positioned in the path of the return measurement beam, the compensating layer producing a mismatch in the index of refraction along the path of the return measurement beam that compensates for the mismatch between the indices of refraction of the object and the  
15 medium.

20